



## A questionnaire survey on various impression techniques used for Implant prosthesis by different practitioners among Ahmedabad & Gandhinagar districts.

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### ABSTRACT:

Growing demands from clinicians and patients to optimize the dental implant treatment protocol require the fabrication of precisely fitting dental implant prosthesis; the prerequisite of which is the accuracy of implant impression. For the accurate fit of implant prosthesis; impression technique and impression material should be accurate. A standard questionnaire (16 questions related to impression for making implant prosthesis) is distributed to different practitioners that includes general Dental practitioners, Academicians and Post graduate students from different colleges among the Ahmedabad and Gandhinagar district, Gujarat. A total of 307 responses were collected, out of which 62.4% preferred implant level open tray impression technique, 36.9% responders preferred using plastic trays for conventional implant impressions followed by 36.6% prefers using custom fabricated trays. 88.2% preferred splinting during impression making from which 67.5% prefer taking multiple implant level open tray impressions with dental floss reinforced by pattern resin. VPS was the most preferred impression material (47.7%) followed by polyether monophase (32%). Majority responders prefer to use Epoxy die resin (40.9%) followed by die stone (37%) as die material for implant impression. Based on 307 responses received, this short study concludes that across Ahmedabad and Gandhinagar districts Implant level open tray impression technique is the most popular; and epoxy resin is the commonly used die material for fabricate the die for implant prosthesis. One of the reasons for prosthetic misfit during implant therapy can be attributed to the prevalent use of other impression material and die materials. Instead of polyether monophase which shows higher accuracy and tear strength, practitioners are using polyvinyl siloxane impression material. More widespread awareness and knowledge need to be provided about the use of polyether monophase. (Despite studies showing greater accuracy with polyether monophase impression material the respondents prefer using VPS).

**KEY WORDS:** Implant impression techniques, Impression materials, splinting method, Prosthetic misfit, Die materials

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### INTRODUCTION

Restorative dentistry is a branch of dentistry that focuses on restoring teeth to their Removable prostheses, fixed prostheses supported by natural teeth, and removable or fixed prostheses supported by dental implants are among the treatment options available to replace missing teeth. By replacing missing teeth, the ideal goal of modern restorative dentistry is to restore function, comfort, and aesthetics for patients [1].

A dental implant is a fixture that is placed within bone that has been prepared for its insertion & the placement is a surgical procedure in which the implant interfaces with the bone to support a dental prosthesis like a crown or a bridge. Implant has now become a major part of general dental practice; however, it requires a team of expertise who would help to achieve an aesthetically pleasing and a biocompatible restoration [2]. Prosthodontic planning should be done before hand the surgical procedure & is an essential part to arrive at a good prognosis for the dental implant. The main goal of an implant impression is to accurately relate an implant or the abutment of the implant to other structures in the dental arch. Taking impressions is one of the most crucial phases in attaining passive fit. The accuracy of dental implants may be influenced by the choice of correct tray, proper imprint processes, kind of impression material, and impression angulation. It is difficult to replicate the oral cavity and transfer it to a laboratory setting for implant prosthesis creation, yet it is necessary for implant success [3].

To avoid prosthesis misfit, a precise impression is required. Misalignment of the prosthesis can cause issues such as screw loosening, screw breakage, implant fracture, and occlusal inaccuracy. The success of implants is determined by the passive fit of the prosthesis and osseointegration [4]. There are numerous impression techniques available for dental implants prosthesis. The techniques can be divided into two major groups which are known as implant level impression and abutment level impression technique. Implant level impression technique subdivided in two groups as open tray impression and closed tray impression. Abutment level impression also subdivided into two categories like Direct and Indirect abutment level impression. The current study was carried out to:

1. Investigate the knowledge and awareness towards impression materials and techniques used to make impressions for dental implant prosthesis in Ahmedabad and Gandhinagar District.
2. Determine the clinical factors that may influence the decision-making process for the selection of impression materials and techniques.

**MATERIAL AND METHODS**

The questionnaire instrument was created and adapted to fit the needs of the local community. A total of 16 questions were included in the survey, which were discussed with dental experts. The potential criteria were discussed at length in focus groups with the practising implant dentistry to identify the questions and their focus. Following changes to clarity and design, the questionnaire was piloted onto a small sample of colleagues; again, following feedback from them, the final and agreed questionnaire was posted. A standard questionnaire 16 questions related to impression for making implant prosthesis (Table 1) is distributed to different practitioners that’s includes general Dental practitioners, Academicians and Post graduate students among the Ahmedabad and Gandhinagar district, Gujarat.

Table 1: Questionnaire for survey

Sr no	Questions :	Options	Answer
1	Participants	General practitioners	
		Post graduate student	
		academicians	
2	Are you aware of various impression techniques available for dental implants ?	Yes	
		No	
3	Which tray you prefer for implant impression ?	Prefabricated tray	
		Custom made tray	
		Tray less impression technique	
		Digital impression	
4	Do you prefer the special component part is required to make ideal implant impression?	Yes	
		No	
5	At what level you prefer the implant impression ?	Implant level impression	
		Abutment level impression	
6	Which impression material you use most commonly for implant impression ?	Vinyl-polysiloxane	
		Polyether monophase	
		Condensation silicone	
		Alginate hydrocolloid material	
7	Which type of component you prefer for making open tray impression?	Transfer or conical type	
		Square and pickup type	
8	Do you think splinting is necessary for multiple implant impression technique ?	Yes	
		No	
		Unsure	
9	Which material do you prefer for splinting during open tray impression technique ?	Splinting with GC pattern resin	
		Splinting with composite resin	
		Splinting with plaster	
		Splinting with self cure acrylic resin	

10	Do you think availability of bone volume and soft tissue affect for deciding impression technique?	Ye	
		No	
11	Do you think that an ideal patient with the single missing tooth, adequate bone volume and soft tissue, the conventional FPD like impression is sufficient ?	Yes	
		No	
12	For multiple non-parallel implants which impression technique you prefer ?	Implant level : open tray technique	
		Implant level : closed tray technique	
		Abutment level impression technique	
		Digital impression technique	
13	The accuracy of implant impressions depends on ?	Tray selection	
		Implant angulations	
		Impression method	
		Coping modifications	
		All of above	
14	Do you prefer verification jig?	Yes	
		No	
15	In case if verification jig is not passive, what will be your next move ?	Make a new impression after sectioning and rejoining jig	
		Make a non splinted impression	
		Move towards the making prosthesis	
16	Based on your experience, misfit is more common in which type of impression technique ?	Open tray technique	
		Closed tray technique	
		Abutment level impression technique.	
17	Which die material you prefer for the accurate detail reproduction in FPD like conventional impression technique for implant ?	Die stone (type IV)	
		Reinforced dental die stone	
		Epoxy resin die	
		Amalgam die	
		Electroplated die	
		Metal sprayed die	

All the participants were given a questionnaire to be filled through google forms, posts, and E-mails. They were explained about the aim and methodology of the study. 307 participants without any bias and prejudice filled the form and replied. Overall, 2 months' time duration was taken to complete the survey. The responses obtained were further analyzed by google form and following results are obtained.

## RESULT

Total 307 responds were collected for this survey; from that 46% are post graduate students, 36% are private practitioners and others are academicians. From 307 responses, 276 responders were aware about the various implant impression technique like implant level and abutment level impression technique. [Figure 1]Most commonly used impression was implant level open tray impression technique (62.4%), followed by implant level closed tray technique (17.6%)[Figure 2]. Most responders prefer using prefabricated plastic tray (36.9%) followed by custom fabricated tray(36.6%) and prefabricated stock metal tray (25.2%) [Figure 3].For fabrication of implant prosthesis most commonly used impression material was vinyl poly siloxane (49%)and polyether monophase (32.4%)[Figure 4].88.2% responders were preferred splinting in impression technique for multiple implants. [Figure 5].88.2 % participants prefer splinting,and 67.5% of those participants prefer splinting with dental floss reinforced with pattern resin. [Figure 6].In case of ideal patient with single missing tooth, with adequate bone volume and soft tissue 69% participants agreed that abutment level impression is sufficient. [Figure 7].For multiple non parallel implant 55.2% prefer implant level open tray technique followed by digital impression technique (18%) [Figure 8]. 81% respondents prefer verification jig for the verification of accurate implant position [Figure 9].81% respondents prefer using verification jig of which in case of a non-passive fit of the jig 84.6% prefer making a new impression after sectioning and re-joining the jig. [Figure 10]. 80.1% participants believe that all the factors like tray selection, implant angulation,

impression technique, impression material, splinting method, and different digital systems affect the accuracy for dental implant prosthesis.[Figure 11].28.8% participants were agreed with implant prosthesis misfit is more common with abutment level impression technique followed by tray less impression technique(27.5%) [Figure 12].For better detail reproduction most commonly, preferred material is epoxy resin die (40.9%) followed by die stone type IV (37%)[Figure 13].

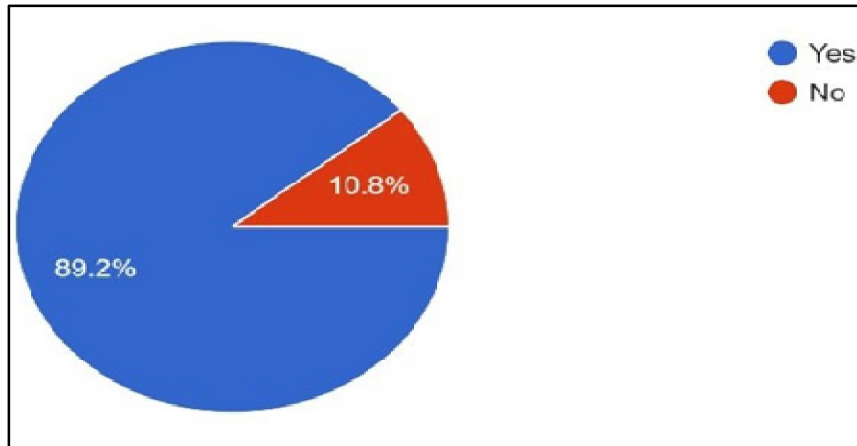


Figure 1: From 307 responses, 276 responders are aware about the various implant impression technique like implant level and abutment level impression technique.

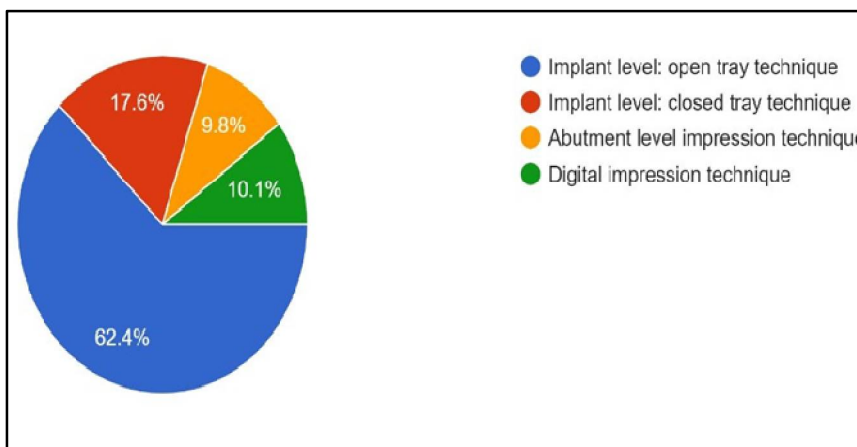


Figure 2: Most commonly used impression is implant level open tray impression technique (62.4%), followed by implant level closed tray technique(17.6%)

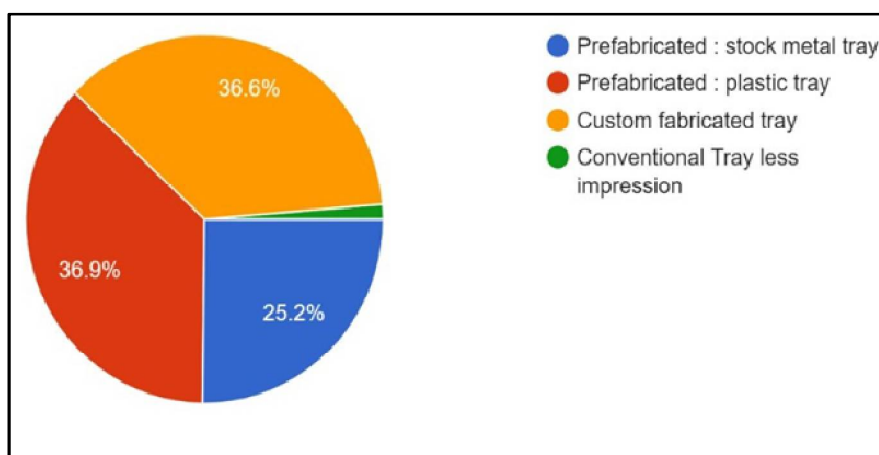


Figure 3: Most responders prefer using prefabricated plastic tray (36.9%) followed by custom fabricated tray(36.6%) and prefabricated stock metal tray (25.2%).

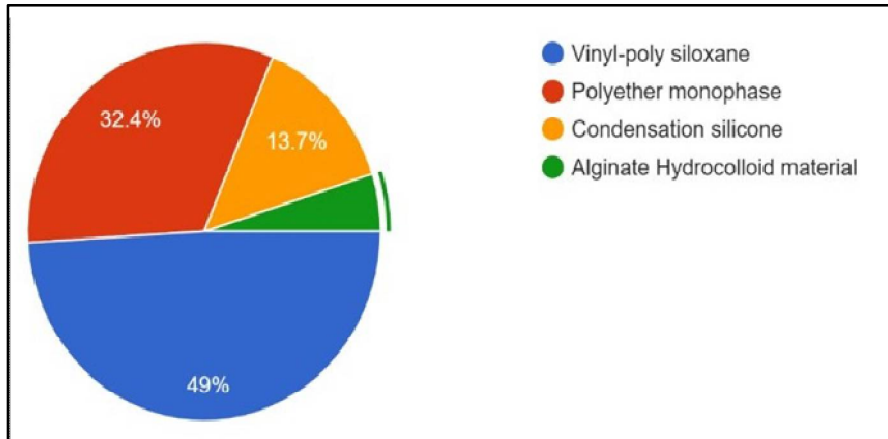


Figure 4: For fabrication of implant prosthesis most commonly used impression material is vinyl poly siloxane (49%) and polyether monophase (32.4%).

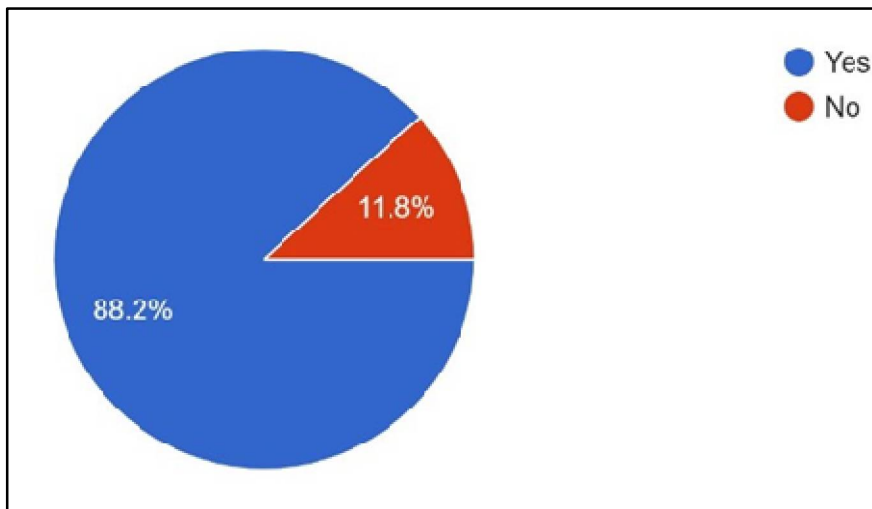


Figure 5: 88.2% responders are preferred splinting in impression technique for multiple implants.

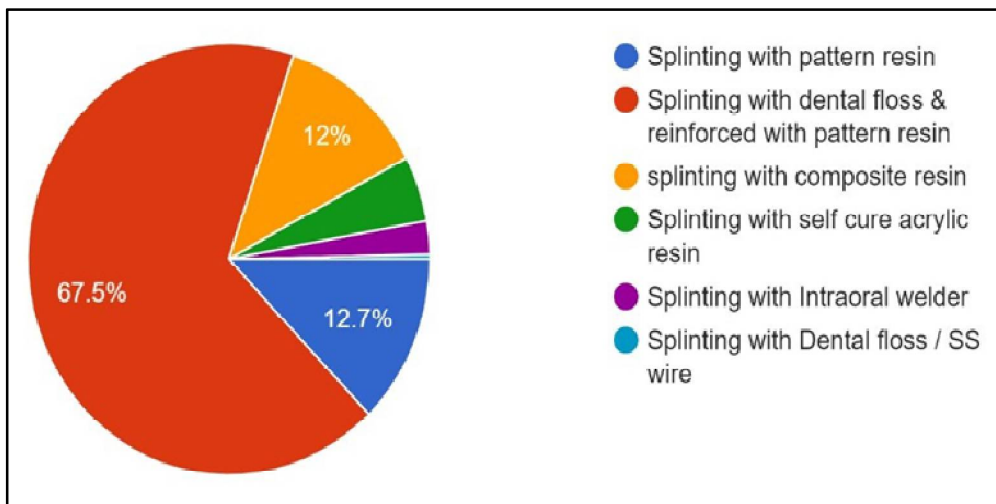


Figure 6: 88.2% participants prefer splinting, and 67.5% of those participants prefer splinting with dental floss reinforced with pattern resin.

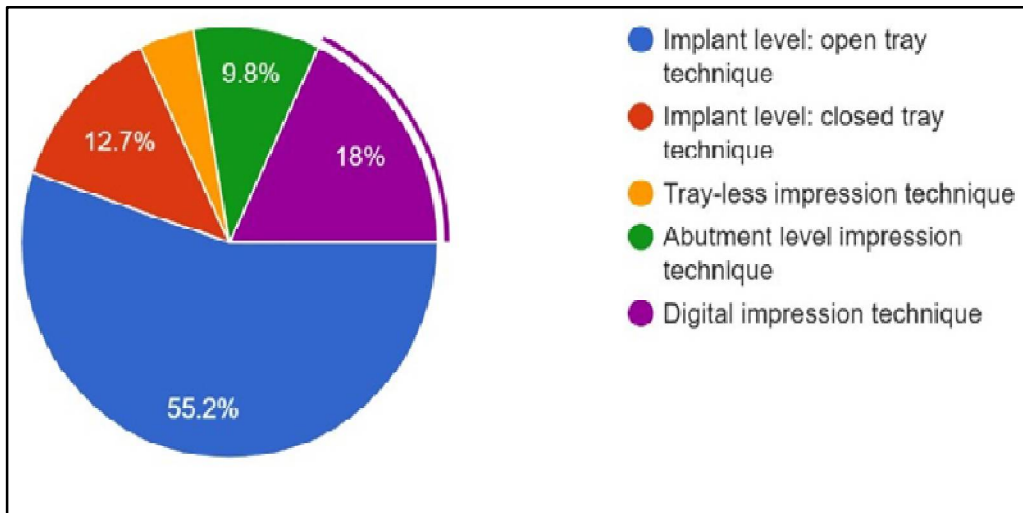


Figure 7: In case of ideal patient with single missing tooth, with adequate bone volume and soft tissue 69% participants agree that abutment level impression is sufficient.

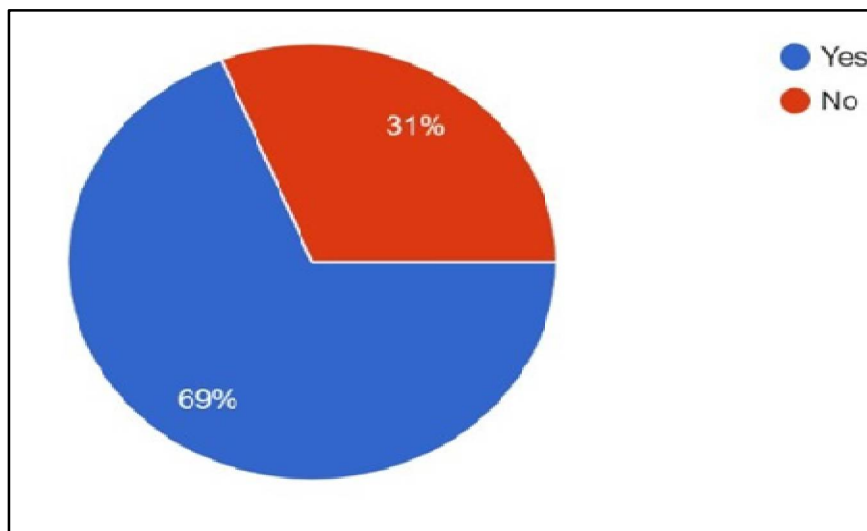


Figure 8: For multiple non parallel implant 55.2% prefer implant level open tray technique followed by digital impression technique (18%).

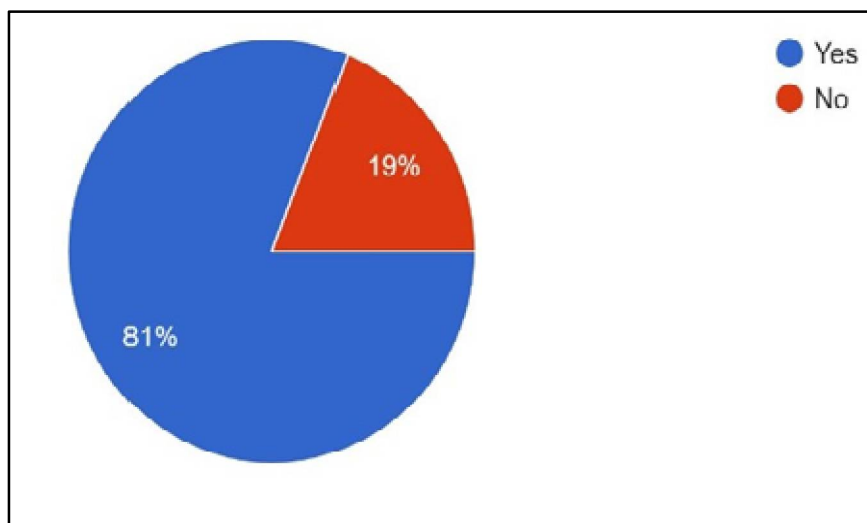


Figure 9: 81% respondents prefer verification jig for the verification of accurate implant position.

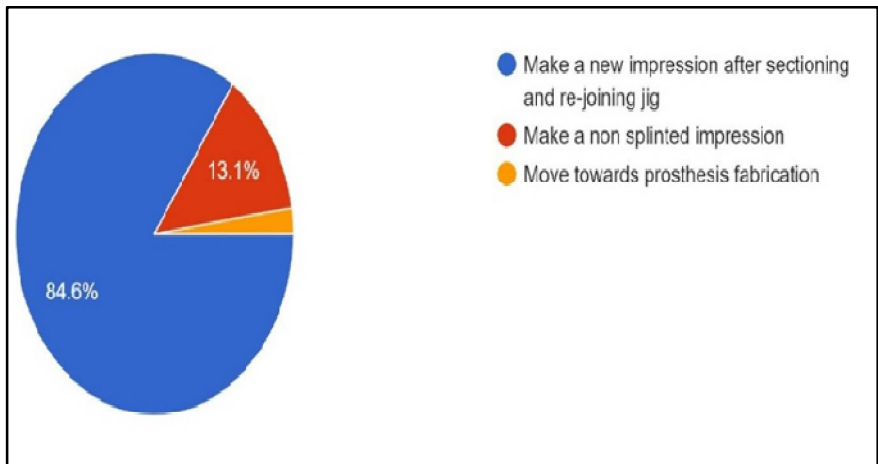


Figure 10: 81% respondents prefer using verification jig of which in case of a non passive fit of the jig 84.6% prefer making a new impression after sectioning and re-joining the jig.

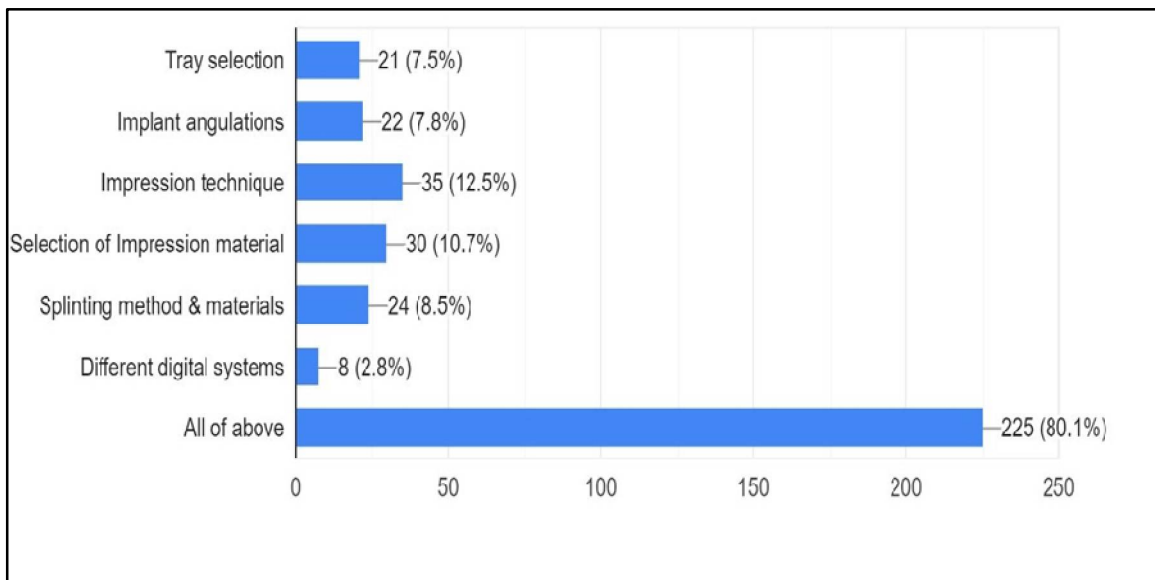


Figure 11: 80.1% participants believe that all the factors like tray selection, implant angulation, impression technique, impression material, splinting method, and different digital systems affect the accuracy for dental implant prosthesis.

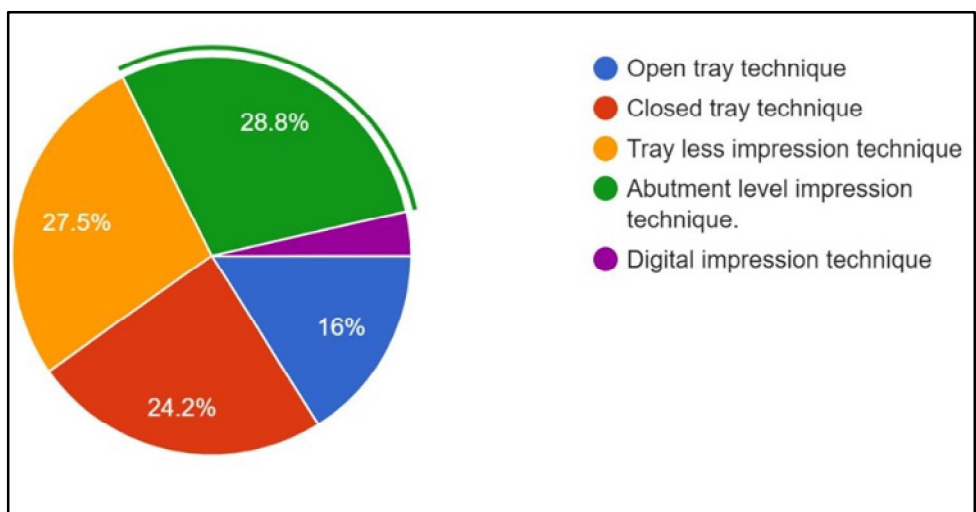


Figure 12: 28.8% participants are agree with implant prosthesis misfit is more common with abutment level impression technique followed by tray less impression technique(27.5%).

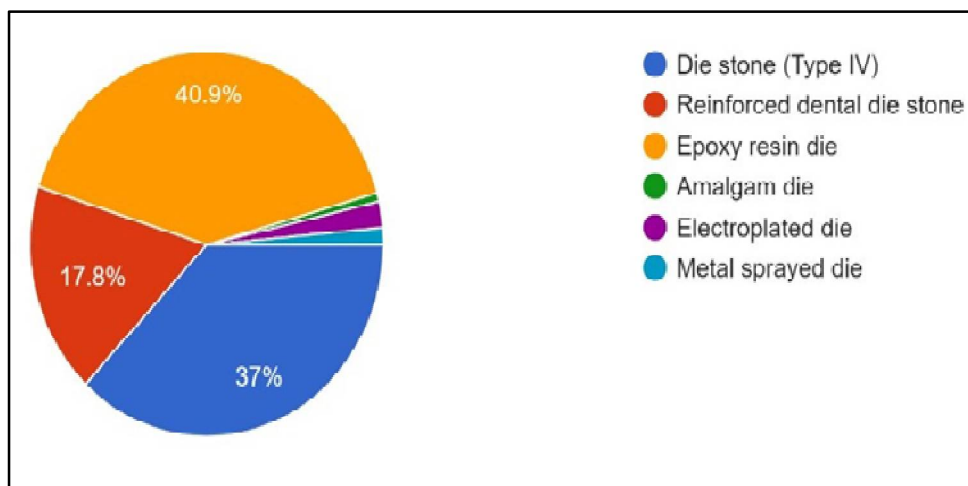


Figure 13: For better detail reproduction most commonly preferred material is epoxy resin die (40.9%) followed by die stone type IV (37%).

## DICUSSION

Accurate impression is a must for fabrication of dental implant prosthesis. Inaccurate or insufficient details recorded in the impression often results in prosthetic misfit. Most participants are using prefabricated plastic tray for impression (36.9%) due to easy to use, no extra appointment for patient, but plastic trays are generally less rigid than prefabricated metal tray and custom fabricated acrylic trays. Custom trays permit the impression material to be used in optimal thickness [6]. Burns J *et al.* found compared *in vitro* the accuracy of open tray implant impressions taken with custom trays or polycarbonate stock trays and found that the formers produced a significantly more accurate impression [7]. The important features for an impression material are that it should have good wet ability. Polyether is hydrophilic material, while polyvinyl siloxane is hydrophobic impression material. The wettability property will actually help in obtain detail reproduction in wet oral surfaces and also established the details properly with gypsum slurry [8]. Although polyether monophase is considered more accurate, 49% respondents still prefer using vinyl poly siloxane. Ubaid Iqbal *et al* (2021) did survey in Jammu and Kashmir region that concludes 29.03% practitioners are not preferring medium body material, while so many studies conclude that medium body impression material is more suitable for implant impression technique [9]. Only 88.2 % respondents prefer splinting for multiple implant impressions. While 67.5% of those prefer splinting with dental floss reinforced with pattern resin. Prosthetic misfit is seen most commonly in impressions taken for multiple non parallel implants. 55.2% respondents of this survey prefer using implant level open tray impression technique for better accuracy and 12.7% use closed tray impression technique for the same. Implant angulation is directly affecting the impression accuracy because of chances of impression material distortion on removal of impression. Two studies reported less accurate impressions with angulated implants than with straight implants using an experimental cast with 4 or 5 implants [10,11]. Daoudi MF 2001, The repositioning of coping was done after making transfer impression, The result showed that all the copings were not returned to their actual location, and this was believed to be the main source of error in the closed tray technique impression technique. This error also could be increased, especially in multiple implants [12]. In case of a non passive fit of the verification jig 84.6% prefer making a new impression after sectioning and re-joining the jig while 13.1% take a non-splinted impression. Most participants (above 80%) believe that all the factors like tray selection, implant angulation, impression technique, impression material, splinting method, and different digital systems affect the accuracy of implant impressions.

## CONCLUSION

Based on 307 responses received, this short study concludes that across Ahmedabad and Gandhinagar districts Implant level open tray impression technique is the most popular; while epoxy resin die is the commonly used die material. One of the reasons for prosthetic misfit during implant therapy can be attributed to the prevalent use of other impression material instead of polyether monophase which shows higher accuracy and high tear strength. The most commonly used die material is epoxy die resin which has more accurate detail reproduction and higher abrasion resistance than die stone which may contribute to the accuracy of the dental implant prosthesis. More widespread awareness and knowledge



needs to be provided about the use of various impression techniques, splinting method, verification of jig and use of different die material.

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